

CLAIMS

1. A semiconductor device having an electrostatic breakdown protection element, comprising:

a semiconductor substrate on which an integrated circuit is formed;

a first ground terminal and a second ground terminal for electrically connecting the integrated circuit to an external ground electrode; and

said electrostatic breakdown protection element electrically connecting the first ground terminal with the second ground terminal,

wherein the first ground terminal is electrically connected to the semiconductor substrate, and the second ground terminal is not electrically connected to the semiconductor substrate.

2. The semiconductor device having the electrostatic breakdown protection element according to Claim 1, wherein the integrated circuit comprises a first circuit which is connected to the first ground terminal and a second circuit which is connected to the second ground terminal.

3. The semiconductor device having the electrostatic breakdown protection element according to Claim 2, wherein the second circuit is a low noise amplifier circuit and the first circuit is a control circuit for controlling a current flowing in the low noise amplifier circuit.

4. The semiconductor device having the electrostatic breakdown

protection element according to any one of Claims 1 to 3, further comprising a laminate portion constructed by alternatively stacking at least one interconnection layer and at least one insulating layer formed above the semiconductor substrate,

wherein the electrostatic breakdown protection element is provided in the interconnection layer farthest apart from the semiconductor substrate.

5. The semiconductor device having the electrostatic breakdown protection element according to any one of Claims 1 to 3, further comprising a laminate portion constructed by alternatively stacking at least one interconnection layer and at least one insulating layer formed above the semiconductor substrate, and

a package including the semiconductor substrate and the laminate portion inside thereof,

wherein the package is a ball grid array package or a wafer level chip size package, and at least one of the interconnection layers is a re-interconnection layer, and the electrostatic breakdown protection element is provided in the re-interconnection layer.

6. The semiconductor device having the electrostatic breakdown protection element according to any one of Claims 1 to 5, wherein the electrostatic breakdown protection element is an aluminum interconnection.

7. The semiconductor device having the electrostatic breakdown protection element according to any one of Claims 1 to 5, wherein the electrostatic breakdown protection element is a copper interconnection.

8. The semiconductor device having the electrostatic breakdown protection element according to any one of Claims 1 to 7, wherein the length between the first ground terminal and the second ground terminal of the electrostatic breakdown protection element is equal to or larger than 2 mm.